89. Apocynum, *No.* 2.—Looking deep down into the bell of *Apocynum androsamifolium* we see what may be likened to a striped conical tent. A more satisfactory view may be had with the aid of a magnifier. This cone is formed by the five anthers meeting in a point: the stripes are the narrow intervals between them. The anthers are shaped like the head of an arrow, but the ends of the barbs are somewhat incurved and conceal the shaft or filament, which is besides bent inward toward the base of the style. This incurving of the base of the anthers makes the lower end of the space or groove between them a little wider than the upper part of the passage and might serve to catch the leg or proboscis of a fly and guide it to the groove. Facing this wider part of the interval, but a little lower, are the sharp triangular projections near the base of the corolla, and beneath, within the filaments, are the five glands or nectaries, probably representing an inner circle of stamens. The pink stripes of the corolla are alternate with its lobes, consequently opposite the stamens; they are sharply defined and form a sort of crown or scale at the junction of the lobes.

On investigating the interior of our conical tent, we find a curious and quite complicated arrangement. In the first place, the lower part or barb of the anther is destitute of pollen. Then, where the filament joins the anther, is a membrane surrounding the middle of the style and uniting it pretty strongly to the stamens, serving at once to hold the anthers in their fixed position, and to screen the base of the style below from the pollen above. The anther consists of two cells, which, when separated below, form what we have called the barbs. Above the insertion of the filament the inner walls of these cells are united into a short column or wall, and further up their edges again become free, and spreading outward nearly meet the edges of the outer walls of their respective cells, so that the slit for the escape of the pollen is almost lateral. Thus the inner side of the anther presents, near the top, the appearance of a smaller two celled anther within the larger one. We may call this apparent anther *antherion*, or little anther. Just below it, on each side of the column mentioned as formed by the consolidation of the inner cell-walls, are two little pockets, just at the end of the openings for the escape of the pollen in the sides of the *antherion*. These pockets are empty, unless they may contain the cell lining in a somewhat disintegrated form: I am not sure of this point. The upper portion of the cells of the *antherion* are also destitute of pollen, and apparently serve only as a protection for the small portion below them which is really polliniferous. The pollen grain is compounded of four spherules as in Periploca.

The pollen bearing portions of the anther, then, it will be seen, open along the lateral edges, and are separated from the corresponding edges of the adjacent anthers only by a very narrow groove, so that, if a small rough thread be drawn through this groove, the pollen on both sides will be disturbed, that is the pollen in the right hand cell of one anther and the left hand cell of the other. This

arrangement brings to mind the pairs of pollen masses derived similarly from adjacent anthers in the closely allied family of the Asclepiadaceæ.

Just above the membrane or partition wall which divides the upper from the lower portion of the style, the latter is surrounded by five small and very glutinous projections, which abut against that portion of the anther which we called a column and are pressed a little into the pockets, so that, in consequence of the depression made by the column, they present somewhat the appearance of ten little knobs. They thus approach nearly the passage of the pollen on both sides of it, but do not block it up. The upper part of the style is glutinous and imperfectly two-lobed : it would naturally be supposed to be the stigmatic surface. Pollen grains are commonly found on it, whether in course of nature or in consequence of disarrangement by dissection. The lower part of the style, below the dissepiment which screens it from the pollen, is top-shaped and tapers down to the point where it joins the ovaries. The broadest portion is a little lower than the base of the anthers, where the space between them is widest, and would naturally afford a foothold for insects sipping the nectar. The filaments are parallel with the tapering base. I have found grains of pollen also but in less abundance on this broadest portion of the style, where it might have been left by an in sect before drawing its foot or trunk up the groove, as it certainly must do sometimes.

I have found many cases of limbs of insects caught in the grooves between the anthers, and, in one instance, the remaining upper portion of a fly who had there "miserably perished," having been held by his proboscis. On another occasion, I found the pollen mass of an Asclepias caught in the base of the groove. To ascertain if a small object drawn through the groove would bring out the pollen, I availed myself of the hooked styles of a Geum. The hooked end came out with a supply of pollen held together by a glutinous substance, as if it had first brushed the glutinous processes that lie on each side of the entrance to the pollen, and next, coming in contact with the pollen, had brought it out. A few days after I found the mass perfectly solidified. If the limb of an insect were too large to more than brush the glutinous projections, or if this substance had begun to harden, it would be difficult for the insect to escape unmutilated.

The plant is quite fertile, but, nevertheless, the larger portion of the flowers fail to produce pods.

In the present paper I have endeavored to state the facts without offering an explanation, though, in trying to make my description intelligible, I could hardly avoid suggesting one. I do not suppose that I have discovered any new points in the structure of this marvellous flower, but I can not find that the mode of fertilization has yet been interpreted, and propose to offer some suggestions on this subject in a concluding article. W. H. L.

90. Aquilegia, Tourn.—A scholar suggests that this word is inex-